IDENTIFYING AND EVALUATING MARYLAND'S HISTORIC BRIDGES

The purpose of this addendum is to aid in the identification and evaluation of Maryland's historic bridges. Because the survey of Maryland's bridges has not yet been undertaken, the information in this addendum is presented at an extremely detailed level and organized by bridge subtype. It is assumed that surveyed resources will have been built and used by the transportation industry for the transportation of goods and people.

Section A presents general expanded National Register criteria for bridge evaluation. Based upon the historic context developed for this project, Section B describes the patterns, events, persons, cultural values, and locational patterns associated with specific bridge types in Maryland. Physical and associative characteristics and how they relate to the historic integrity of specific bridge types are presented in Section C. A bridge may also be a contributing resource within a National Register-listed or eligible historic district. Section D, "Bridges as Contributing Resources within Historic Districts," presents guidelines relating to contributing resource determination.

SECTION A. EXPANDED NATIONAL REGISTER CRITERIA FOR BRIDGE EVALUATION

The following expanded National Register criteria are recommended for evaluating bridges. In order to qualify for listing, the resources must be intact examples of one of the subtypes. They must possess integrity of location, design, setting, materials, and association, except where noted (e.g., C.6.).

Examples offered below to illustrate the following criteria are intended to guide, rather than limit, application of the criteria in bridge evaluation. These examples and those offered in Section B provide general guidelines for criteria application.

> *A bridge is eligible for the National Register of Historic Places if it meets one of the following criteria:*
>
> *(A) It is associated with events that have made a significant contribution to the broad pattern of our history.*
>
> > *A.1. reflects trends in the social, economic, industrial, and transportation development of the locality, state, region, or nation;*

A.2. is associated with historical crossings.

(B) It is associated with the lives of persons significant in our past.

B.1. is associated with the efforts of specific individuals or groups significant in the history of the locality, region, state, or nation.

(C) It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values.

C.1. is significant in the history of bridge engineering, in the history of bridge design principles, or in the development of bridge construction techniques;

C.2. is an example of bridges designed or built by renowned engineers, craftsmen, bridge companies, or contractors;

C.3. is a significant example of engineering solutions developed in response to conditions characteristic of the locality or region;

C.4. reflects traditional forms or construction techniques, or exemplifies innovative technological solutions;

C.5. retains sufficient integrity of design, materials, workmanship, association, setting, and location to stand as a representative example of a specific bridge type which may survive in substantial numbers;

C.6. exemplifies a bridge type which is now rare, even though its integrity may be compromised to a greater degree;

C.7. possesses architectural or artistic distinction in overall design or detailing.

(D) It has yielded, or may be likely to yield, information important in history or prehistory.

D.1. is likely to reveal important information on the development of bridge technology;

D.2. may yield important information on the work of a currently unknown or little-known bridge builder.

A Note on Criterion D Eligibility

In certain instances, a bridge may be eligible for the National Register of Historic Places under Criterion D, for properties that have yielded, or may be likely to yield, information important in prehistory or history. Criterion D is intended to address the need for data obtained directly from physical structures to answer important research questions. Criterion D eligibility has two initial requirements, *both of which must be met in order for a bridge to qualify*:

1. The bridge must have, or have had, information important to our understanding of human history or prehistory, and

2. The information must be considered important.

Under the first requirement, a bridge may be eligible for the National Register if it has been used as a source of data and contains more as yet unretrieved data. A bridge may also be eligible if it has not yet yielded information but, through testing or research, is determined a likely source of data.

Under the second requirement, the information must be carefully evaluated within an appropriate context to determine its importance. Information is considered important when it is shown to have a significant bearing on a research design that addresses current data gaps, alternative theories that challenge existing ones, or priority areas identified under a State or Federal agency management plan.

Bridges must meet these two requirements in order to be eligible under Criterion D. Additionally, a bridge must be, or must have been the *principal* source of the information. Generally, bridges may be likely to reveal important information on the development of bridge technology, or on the work of a currently unknown or little-known bridge builder. Bridges likely to be eligible under Criterion D may include:

1. Bridges of types rarely represented in the state, region, or nation.

2. Bridges of technologically innovative types or designs, where little or no additional information is available about the innovations employed.

3. Bridges built or designed by little-known persons, groups, bridge builders, engineers, or firms.

4. The oldest Maryland examples of each particular bridge type and subtype (including twentieth century structures of standardized or common design or configuration). Such bridges are eligible as the principal sources for important information concerning the introduction and early development of bridge technologies within Maryland. For each bridge type or subtype, more than one such early bridge may be evaluated as eligible under Criterion D.

SECTION B. PATTERNS, EVENTS, PERSONS, CULTURAL VALUES, AND LOCATIONAL PATTERNS TO CONSIDER BY SUBTYPE

1. TIMBER BRIDGES

A. Timber-Beam Bridges

Patterns:

Timber-beam bridges are generally associated with the steady expansion of the rural road network throughout Maryland in the period of significance (1724-circa 1900), under local and county authority. Multiple-span timber-beam highway bridges may be associated with the growing professionalism of highway engineering in Maryland during the latter part of the period.

Events:

Timber-beams should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A timber-beam bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Timber-beams should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular timber-beam bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Persons:

Timber-beams should be evaluated for significant association with specific builders, engineers or architects, or builders. These may include individual professionals, engineering or architectural firms of local, state, or national importance, government agencies, as well as significant nonprofessional builders. *Timber-beams known to have been built by local labor are not eligible through such association alone*.

Timber-beam bridges like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Timber-beam bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a timber-beam bridge associated with the group may be eligible. Otherwise, a timber-beam bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Cultural Values:

Timber-beam bridges are not generally associated with specific cultural values. Like stone arches, they embody a craftsman tradition deriving from colonial and European sources.

Locational Pattern:

In Maryland, timber-beam bridges may be expected to have been built throughout the state, but with a likely preponderance in low-lying Tidewater areas.

B. Timber-Truss (Uncovered) Bridges

Patterns:

Timber-truss (uncovered) bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the period of significance (1800-1900), under local and county authority. Long-span timber-truss (uncovered) highway and railroad bridges were built during the early part of the period for major river crossings of highways and railroads.

Timber-truss (uncovered) bridges are also associated with the transition to professionalism within American civil engineering during the period of significance. Many timber-truss (uncovered) bridges were built to popular proprietary or patented designs (Burr, Town, Howe, and others) developed during the early nineteenth century by bridge builders.

Events:

Timber-truss (uncovered) bridges should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A timber-truss (uncovered) bridge may derive significance from such association

alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Timber-truss (uncovered) bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular timber-truss (uncovered) bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Since many timber-truss (uncovered) bridges were built to popular proprietary or patented designs (Burr, Town, and others) developed during the early nineteenth century by bridge builders, a timber-truss (uncovered) bridge also may retain significance as a good or representative Maryland example of a particular proprietary or patented type (*earliest* and *longest* examples included).

Persons:

Timber-trusses should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. *Timber-truss (uncovered) bridges known to have been built by local labor are not eligible through such association alone*.

Timber-truss (uncovered) bridges like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Timber-truss (uncovered) bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a timber-truss (uncovered) bridge associated with the group may be eligible. Otherwise, a timber-truss (uncovered) bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Cultural Values:

Timber-truss (uncovered) bridges are not generally associated with specific cultural values. Like timber-beam and stone arch bridges, they do embody a craftsman tradition deriving from colonial and European sources. Associated with the craftsman tradition as well as proprietary or patented designs, timber-

truss (uncovered) bridges represent the nineteenth-century transition toward professional bridge engineering.

Locational Pattern:

In Maryland, timber-truss (uncovered) bridges were built throughout the state, but with a probable predominance in the Piedmont and Appalachian Plateau areas.

C. Timber-Truss Covered Bridges

Patterns:

Timber-truss covered bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the period of significance (1800-1900), under local and county authority. Long-span timber-truss highway and railroad bridges were built during the early part of the period for major river crossings of highways and railroads.

Timber-truss covered bridges are also associated with the transition to professionalism within American civil engineering during the period of significance. Many timber-truss bridges were built to popular proprietary or patented designs (Burr, Town, Howe, and others) developed during the early nineteenth century by bridge builders.

Events:

Timber-truss covered bridges should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A timber-truss covered bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Timber-truss covered bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular timber-truss bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Since many timber-truss bridges were built to popular proprietary or patented designs (Burr, Town, and others) developed during the early nineteenth century by bridge builders, a timber-truss bridge also may retain significance as a good or representative Maryland example of a particular proprietary or patented type

(*earliest* and *longest* examples included).

Persons:

Timber-trusses should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. *Timber-truss covered bridges known to have been built by local labor are not eligible through such association alone*.

Timber-truss bridges like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Timber-truss bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a timber-truss bridge associated with the group may be eligible. Otherwise, a timber-truss bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Cultural Values:

Timber-truss bridges are not generally associated with specific cultural values. Like timber-beam and stone arch bridges, they do embody a craftsman tradition deriving from colonial and European sources. Associated with the craftsman tradition as well as proprietary or patented designs, timber-truss bridges represent the nineteenth-century transition toward professional bridge engineering.

Locational Pattern:

In Maryland, timber-truss bridges were built throughout the state, but with a probable predominance in the Piedmont and Appalachian Plateau areas.

D. Timber-Trestle Bridges

Patterns:

Timber-trestle bridges are generally associated with the steady expansion of the rail transportation network, including railroads and street railways, throughout Maryland in the period of significance (1840-1900).

Timber-trestle bridges are also associated with the rise of professionalism within

American civil engineering during the period of significance. Timber-trestle bridges were typically built by railroads or street railways to carry rail traffic efficiently and inexpensively over deep ravines or gorges.

Events:

Timber-trestle bridges should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A timber-trestle bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Timber-trestle bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular timber-trestle bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Persons:

Timber-trestle bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. *Timber trestles known to have been built by local labor are not eligible through such association alone*.

Timber-trestle bridges like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Timber-trestle bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a timber-trestle bridge associated with the group may be eligible. Otherwise, a timber-trestle bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Cultural Values:

Timber-trestle bridges are not generally associated with specific cultural values.
Locational Pattern:

In Maryland, timber-trestle bridges were built throughout the state, but with a probable predominance in the more rugged Piedmont and Appalachian Plateau areas.

E. Timber-Concrete Composite Bridges

Patterns:

Timber-concrete composite bridges are specifically associated with the expansion and improvement of the Maryland state roads network, under the aegis of the State Roads Department, during the period of significance (1935-1960).

Events:

Timber-concrete composite bridges should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A timber-concrete composite bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Timber-concrete composite bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular timber-concrete composite bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Persons:

Timber-concrete composite bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Many timber-concrete composite bridges derive significance from association with the effort of engineers of the Maryland State Roads Commission to improve Tidewater highways, during the period of significance. *Timber-concrete composite bridges known to have been built by local labor are not eligible through such association alone*.

Timber-concrete composite bridges like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Timber-concrete composite bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a timber-concrete composite bridge associated with the group may be eligible. Otherwise, a timber-concrete composite bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Cultural Values:

Timber-concrete composite bridges are not generally associated with specific cultural values.

Locational Pattern:

In Maryland, timber-concrete composite bridges were built primarily, if not exclusively, in the lower-lying Tidewater area, where conditions favored their construction by the Maryland State Roads Commission at important highway crossings over water bodies.

2. STONE ARCH BRIDGES

Patterns:

Stone arch bridges are generally associated with the steady expansion of the transportation network, including roads, railroads, and canals, throughout Maryland in the periods of significance.

Stone arch highway bridges constructed during the 1790-1830 period are typically associated with the improvement of Maryland's road system through construction of turnpikes and the National Road. Stone arch highway bridges built after 1830 reflect the further expansion of the road system, and the gradual refinement of stone arch bridge engineering and construction.

Stone arch railroad bridges built between 1825 and 1850 are associated with the initial founding and expansion of railroads (notably the B&O Railroad) throughout Maryland. Stone arch railroad bridges built between 1850 and 1910 reflect the further expansion and improvement of the rail network, and the gradual refinement of stone arch bridge engineering and construction.

Stone arch canal bridges (including aqueducts and culverts) built between 1828 and 1924 are generally associated with the construction and operation of the C&O Canal, Maryland's prime canal through the Piedmont and Appalachian Plateau.

Events:

Stone arch bridges should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A stone arch bridge may derive significance from such association alone, under the historic period theme of "transportation", as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Stone arch bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular stone arch bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Stone arches may be associated with specific transportation-related events of significance that occurred over time, such as the construction of the National Road or specific turnpikes, the building and expansion of the B&O Railroad and other railroads, and the building and operation of the C&O Canal and other canals.

Persons:

Stone arch bridges should be evaluated for significant association with specific builders, masons, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad, canal) engineering departments.

Stone arches like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Stone arch bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a stone arch bridge associated with the group may be eligible. Otherwise, a stone arch bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Cultural Values:

Stone arch bridges are not generally associated with specific cultural values. They do embody a craftsman tradition derived from colonial and European sources. Stone arch highway bridges built between 1790 and 1830, and stone arch railroad bridges built between 1825 and 1850, are often associated with locally prominent craftsmen such as the Lloyds and their associates. Refining the basic earlier craftsman tradition, stone arch highway and railroad bridges built after 1850 may be associated with specific engineers, or highway and railroad engineering departments.

Locational Pattern:

In Maryland, stone arch bridges were built primarily in the Piedmont and Appalachian Plateau areas, where building materials were readily found and site conditions were favorable.

3. METAL TRUSS BRIDGES

Patterns:

Metal truss bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the periods of significance.

Metal truss highway and railroad bridges of the 1840-1860 period are significantly associated with the initial development of metal truss bridge design, and the transition from truss building solely in timber to iron truss design and construction. Truss bridges built in this period are also often associated with early proprietary or patented designs.

Metal truss highway and railroad bridges of the 1860-1900 period are associated with the late nineteenth century popularization and scientific standardization of truss design and construction for highway and railroad use. Truss bridges built in this period also often are associated with a wide variety of proprietary or patented designs.

Metal truss highway and railroad bridges of the 1900-1960 period are associated with the increasing standardization of highly useful simply-designed truss types (primarily Pratt and Warren variants), and are also associated with select use in Maryland's monumental highway spans and their approaches.

Events:

Metal truss bridges should be evaluated for any specific association with

maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A metal truss bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Metal truss bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular metal truss bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Metal trusses may be associated with specific transportation-related events of significance that occurred over time, such as improvement of specific turnpikes, highways, or railroads, and the expansion of the B&O Railroad and other railroads.

Metal trusses may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented truss designs.

Persons:

Metal truss bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Metal truss bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, owing to the design of such bridges to a wide variety of patented or proprietary truss types during all periods of significance. Metal trusses should be evaluated for their association with particular proprietary or patented design types, and their designers (including less well-represented types as well as the more commonly found Pratt and Warren variants).

Metal truss bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a metal truss bridge associated with the group may be eligible. Otherwise, a metal truss bridge associated with a group should be evaluated for association with specific Maryland political,

economic, social or military events associated with the group (see "Events" discussion above).

Metal trusses like other bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Metal truss bridges are not generally associated with specific cultural values.

Locational Pattern:

Metal truss bridges were built throughout the state.

4. MOVABLE BRIDGES

Patterns:

Movable bridges of all types are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the periods of significance. Movable bridges are also generally associated with the maritime history of Maryland, the maritime history of specific regions and jurisdictions (counties, towns, cities, other communities), and specifically with the maritime and navigation history of particular navigable bodies of water or canals.

Movable bridges of the 1790-1850 period are associated with the introduction and initial Maryland use of movable spans (primarily swing and bascule bridges) at key highway and railroad crossings of navigable bodies of water.

Movable bridges of the 1850-1900 period are generally associated with scientific and technological improvements in movable bridge design and construction, such as the employment of metal and the development of new variants of bascule, swing, and vertical lift designs and patents.

Movable bridges of the 1900-1940 period are generally associated with the design and construction of major, modern significant movable spans built in Maryland, by the State Roads Commission and other governmental authorities as well as major railroads.

Events:

Movable bridges should be evaluated for any specific association with maintenance of important stream and river crossings (and for association with navigation on the relevant water body) near individual communities, farmsteads,

mills, commercial sites, or industrial sites. A movable bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Movable bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular movable bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Movable bridges may also be associated with specific transportation-related events of significance that occurred over time, such as improvement of specific highways or railroads, or the improvement of navigation along a specific body of water or within a specific jurisdiction.

Movable bridges may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented movable bridge designs.

Persons:

Movable bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Movable bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, owing to the design of such bridges to a wide variety of patented or proprietary movable bridge types during all periods of significance. Movable bridges should also be evaluated for their association with particular proprietary or patented movable bridge design types, and their designers (including well-known variants as well as lesser-known types).

Movable bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a movable bridge associated with the group may be eligible. Otherwise, a movable bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Movable bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Movable bridges are not generally associated with specific cultural values.

Locational Pattern:

In Maryland, movable bridges of all types were built primarily in the lower-lying Tidewater area, where the need to preserve the commercial navigability of bodies of water favored their construction in all periods of significance.

5. METAL GIRDER BRIDGES

Patterns:

Metal girder bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the periods of significance.

Metal girder bridges built between 1846 and 1870 are generally associated with the introduction and early spread of metal girder bridge technology in Maryland, for railroad and highway use.

Metal girder bridges built between 1870 and 1920 are generally associated with the late nineteenth century and early twentieth century popularization and scientific standardization of metal girder design and construction for highway and railroad use.

Metal girder bridges built between 1920 and 1965 are generally associated with increasingly heavy employment of metal girder bridges for highway and railroad bridges, by governmental authorities (the State Roads Commission and county and municipal agencies) and corporate organizations such as railroads. Many metal girder bridges of this period are associated with the state and national grade crossing elimination movement, a continuing public effort to eliminate dangerous at-grade crossing of railroad tracks by automotive and wagon traffic.

Events:

Metal girder bridges should be evaluated for any specific association with maintenance of important stream and river crossings (and for association with navigation on the relevant water body) near individual communities, farmsteads,

mills, commercial sites, or industrial sites. A metal girder bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Metal girder bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular metal girder bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Metal girder bridges may also be associated with specific transportation-related events of significance that occurred over time, such as improvement of specific highways or railroads. Many metal girder bridges built between 1920 and 1965 are associated with the grade crossing elimination movement, a continuing public effort to eliminate dangerous at-grade crossing of railroad tracks by automotive and wagon traffic.

Metal girder bridges may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented metal girder bridge designs.

Persons:

Metal girder bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Metal girder bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, owing to the design of such bridges to a variety of patented or proprietary girder types during all periods of significance. Metal girder bridges should be evaluated for their association with particular proprietary or patented metal girder bridge design types, and their designers (including well-known variants as well as lesser-known types).
Metal girder bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a metal girder bridge associated with the group may be eligible. Otherwise, a metal girder bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Metal girder bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Metal girder bridges are not generally associated with specific cultural values.

Locational Pattern:

Metal girder bridges were built throughout the state.

6. METAL SUSPENSION BRIDGES

Patterns:

Metal suspension bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the periods of significance.

Metal suspension bridges built between 1800 and 1840 are generally associated with the introduction of metal cable and wire rope suspension span technology in Maryland and surrounding states, by suspension bridge pioneers Finley and Ellet and associates.

Metal suspension bridges built between 1850 and 1900 are generally associated with the popularization and spread of metal cable and wire rope suspension span technology in Maryland and surrounding states. A select, known specific class of metal suspension bridge built in this period of significance are locally engineered swinging footbridges built for pedestrian access to commercial and industrial sites in Maryland.

Metal suspension bridges built between 1900 and 1960 are generally associated with the refinement of wire rope suspension bridge technology, reflecting the influence of master engineers such as the Roeblings and Othmar Ammann.

Events:

Metal suspension bridges should be evaluated for any specific association with maintenance of important stream and river crossings (and, in the case of high, monumental fixed spans, for association with navigation on the relevant water body) near individual communities, farmsteads, mills, commercial sites, or industrial sites. A metal suspension bridge may derive significance from such

association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Metal suspension bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular metal suspension bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Metal suspension bridges may also be associated with specific transportation-related events of significance that occurred over time, such as improvement of specific highways or railroads. Monumental, metal suspension bridges of the 1900-1960 period are specifically associated with the Maryland State Roads Commission's continuing effort to improve significant major water crossings (the notable example is the Chesapeake Bay Bridge).

Metal suspension bridges may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented metal suspension bridge designs.

Persons:

Metal suspension bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Metal suspension bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, owing to the design of such bridges to a variety of patented or proprietary suspension bridge types during all periods of significance. Metal suspension bridges should be evaluated for their association with particular proprietary or patented metal suspension bridge design types, and their designers (including well-known variants as well as lesser-known types).

Metal suspension bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a metal suspension bridge associated with the group may be eligible. Otherwise, a metal suspension bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events"

discussion above).

Metal suspension bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Metal suspension bridges are not generally associated with specific cultural values.

Locational Pattern:

Metal suspension bridges were built throughout the state.

7. METAL ARCH BRIDGES

Patterns:

Metal arch bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the periods of significance.

Metal arch bridges built between 1870 and 1900 are generally associated with the introduction of metal bowstring arch and deck arch technology to the state, exemplified by small rural bowstring arch-truss bridges as well as larger, more ornamented Baltimore City structures of the 1880s.

Metal arch bridges built between 1930 and 1960 are generally associated with the design and construction of modern through bowstring arches by the State Roads Commission, Baltimore City, and other authorities.

Events:

Metal arch bridges should be evaluated for any specific association with maintenance of important stream and river crossings (and, in the case of high, monumental arch spans, for association with navigation on the relevant water body) near individual communities, farmsteads, mills, commercial sites, or industrial sites. A metal arch bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Metal arch bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible

under association with such specific events, a particular metal arch bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Metal arch bridges may also be associated with specific transportation-related events of significance that occurred over time, such as improvement of specific highways or railroads. Monumental, metal arch bridges of the 1930-1960 period are specifically associated with the Maryland State Roads Commission's continuing effort to improve significant major water crossings.

Metal arch bridges may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented metal arch bridge designs.

Persons:

Metal arch bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Metal arch bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, owing to the design of such bridges to a variety of patented or proprietary metal arch types during all periods of significance. Metal arch bridges should be evaluated for their association with particular proprietary or patented metal arch bridge design types, and their designers (including well-known variants as well as lesser-known types).

Metal arch bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a metal arch bridge associated with the group may be eligible. Otherwise, a metal arch bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Metal arch bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Metal arch bridges are not generally associated with specific cultural values.

Locational Pattern:

Metal arch bridges were built throughout the state.

8. METAL CANTILEVER BRIDGES

Patterns:

Metal cantilever bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the period of significance.

Metal cantilever bridges built between 1900 and 1940 are generally associated with the scientific development and refinement of cantilever truss design and construction (exemplified by Maryland's outstanding monumental cantilever, the 1940 Governor Harry W. Nice Memorial Bridge).

Events:

Metal cantilever bridges should be evaluated for any specific association with maintenance of important stream and river crossings (and, in the case of high, monumental cantilever spans, for association with navigation on the relevant water body) near individual communities, farmsteads, mills, commercial sites, or industrial sites. A metal cantilever bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Metal cantilever bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular metal cantilever bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Metal cantilever bridges may also be associated with specific transportation-related events of significance that occurred over time, such as improvement of specific highways or railroads. Monumental, metal cantilever bridges of the 1900-1940 period are specifically associated with the Maryland State Roads Commission's continuing effort to improve significant major water crossings.

Metal cantilever bridges may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented metal cantilever bridge designs.

Persons:

Metal cantilever bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Metal cantilever bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, due to the design of such bridges to a variety of patented or proprietary cantilever types during all periods of significance. Metal cantilever bridges should be evaluated for their association with particular proprietary or patented metal cantilever bridge design types, and their designers (including well-known variants as well as lesser-known types).

Metal cantilever bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a metal cantilever bridge associated with the group may be eligible. Otherwise, a metal cantilever bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Metal cantilever bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Metal cantilever bridges are not generally associated with specific cultural values.

Locational Pattern:

Metal cantilever bridges were likely built throughout the state.

9. CONCRETE BRIDGES

Patterns:

Concrete bridges are generally associated with the steady expansion of the transportation network, including roads and railroads, throughout Maryland in the period of significance.

Concrete bridges built between 1890 and 1910 are generally associated with the introduction of concrete and reinforced concrete technology to the state, under the leadership of Baltimore City, Baltimore County, the Maryland Geological Survey Highway Division, and the State Roads Commission.

Concrete bridges built between 1910 and 1940 may generally be associated with the increasing standardization of small concrete bridges (notably beam bridges, simple arches, and culverts) by state and local authorities. Some bridges of this period are associated with the further refinement of concrete bridge design and technology (notably open-spandrel ribbed arches and rigid frames).

Concrete bridges built between 1910 and 1940 may also be associated with the influence in Maryland of the nationwide "City Beautiful" movement (notably Luten arches and open-spandrel ribbed arches).

Concrete bridges built between 1910 and 1940 may also be associated with the grade crossing elimination, a continuing public effort to eliminate dangerous at-grade crossing of railroad tracks by automotive and wagon traffic (notably concrete beam bridges).

Concrete bridges built between 1940 and the present are generally associated with continuing scientific testing and standardization of concrete highway bridge technology, and the development of prestressing techniques.

Events:

Concrete bridges should be evaluated for any specific association with maintenance of important stream and river crossings near individual communities, farmsteads, mills, commercial sites, or industrial sites. A concrete bridge may derive significance from such association alone, under the historic period theme of "transportation," as defined in Maryland Historical Trust, *Maryland Supplement to National Register Bulletin* 16A (1992).

Concrete bridges should also be evaluated for significant association with specific Maryland political, economic, social, or military events. To be eligible under association with such specific events, a particular concrete bridge must have played a direct, documented historical role in such events. For this kind of specific event association, it is not sufficient for the bridge to be a *successor* to the actual bridge where the event took place.

Concrete bridges may also be associated with specific transportation-related

events of significance that occurred over time, such as improvement of specific highways or railroads. Technological innovations of the late nineteenth and early twentieth century, many concrete bridges are associated with local and state governmental efforts to improve Maryland's road system.

Concrete bridges may also be associated with events important in the history of bridge engineering, such as the evolution of specific proprietary or patented concrete bridge designs.

Persons:

Concrete bridges should be evaluated for significant association with specific builders, engineers, or architects. These may include individual professionals, engineering or architectural firms of local, state, or national importance, as well as significant nonprofessional builders. Also included are governmental (state, county, city, or local) and corporate (railroad) engineering departments.

Concrete bridges may be significantly associated with individual bridge builders, engineers, or bridge-building companies, owing to the design of such bridges to a variety of patented or proprietary concrete types during all periods of significance. Concrete bridges should be evaluated for their association with particular proprietary or patented concrete bridge design types, and their designers (including well-known variants as well as lesser-known types).
Concrete bridges may also be eligible for the National Register if they are associated with the efforts of specific individuals or groups significant in the history of a Maryland community, region, the state itself, or the nation. If a group includes members of individual distinction, a concrete bridge associated with the group may be eligible. Otherwise, a concrete bridge associated with a group should be evaluated for association with specific Maryland political, economic, social or military events associated with the group (see "Events" discussion above).

Concrete bridges may also be associated with specific persons of local, state, or national importance, through association with specific political, economic, social, or military events.

Cultural Values:

Concrete bridges are not generally associated with specific cultural values.

Locational Pattern:

Concrete bridges were built throughout the state.

10. BROAD PATTERNS

Geographical and Topographical Association:

Geography and topography exert influence over bridge building throughout all periods of significance. This geographical or topographical association appears to be strongest in Maryland for movable bridges (Tidewater), stone arches (Piedmont, Appalachian Plateau), and timber-concrete composite bridges (Tidewater).

Bridge types often tailored for Tidewater conditions include timber beam, timber-concrete composite structures, movables of all types, and high, fixed spans of many types, including long timber covered bridges, suspension spans, metal arches, and cantilevers. Due to unavailability of locally quarried stone, the Tidewater does not generally feature stone arch bridges. Where watercourses were not or were no longer required for navigation, lower fixed spans of all types were built.

Bridge types often tailored for Piedmont conditions include nearly all types, although movable bridges were rare (confined to railroad spans over the C&O Canal). Stone arches on turnpike routes leading out of Baltimore are a special category of bridge adapted for the Piedmont. The versatile covered timber and metal truss bridges gained ascendancy at small and medium-sized crossings during the nineteenth century; their moderate-span successors, concrete bridges, also superseded many stone arches.

Bridge types often tailored for Appalachian Plateau conditions include nearly all types, although movable bridges were rare (confined to railroad spans over the C&O Canal). Conditions familiar in the Piedmont (steep cuts, limited available crossings) were accentuated in the Plateau area; bridge types built, however, were essentially the same as those seen in the Piedmont.

SECTION C. PHYSICAL AND ASSOCIATIVE CHARACTERISTICS AND HISTORIC INTEGRITY CONSIDERATION

Historic integrity evaluation will depend on the level of integrity of location, design, setting, materials, and association. Materials evaluation requires clearly delineated characteristics of the resource type, with orders of importance stated. This is presented below. Integrity of location, setting, and association is a subjective evaluation, which needs to be considered as a part of the total resource integrity. Materials integrity will depend on the compromise to primary elements, with consideration of secondary elements for most bridge types. Commonly built, standardized bridge types which survive in large numbers should present integrity of all primary and secondary elements, and in some cases, tertiary elements.

For bridges being evaluated as possible contributing resources in a historic district, an additional guide to assessing character-defining elements has been provided (see Section D below for further discussion of bridges as contributing and noncontributing resources). Those elements which are character-defining elements are designated with [CDE]. In most cases those elements designated as primary [P] are also designated as character-defining elements [CDE], but not always. For example, identifying plaques, plates, and imprints, while helping to establish a bridge's individual eligibility, are not essential in determining a bridge's ability to contribute to the historic architectural qualities, historic associations, or archeological values for which a district is significant. For guidelines concerning bridges as contributing resources in historic districts, see Section D.

Element Importance

Element importance is dependent on the type of bridge in question. For each type of bridge there is a hierarchy of elements: those with primary importance [P] contribute in a major way to the structure's essential characteristics; those with moderate importance [S] are less crucial to those characteristics; tertiary elements [T] are incidental to the structure's essential characteristics. It should be noted that there are some elements, i.e., bridge plaques, that are very desirable when extant; they are given the highest element importance rating, as they often perform a major role in establishing the structure's significance. With regard to ornamentation, it should be noted that applied ornamentation is considered as a separate element; integral ornamentation, e.g., panels on a concrete arch bridge spandrel, are subsumed under the element itself.

If a bridge was designed with another design co-objective, additional functional features, e.g., water flow control devices, have an increased importance. Such additional functional features are considered at the end of this section.

Degree of Compromise

Degree of compromise refers to the amount of element destruction or replacement that has occurred. Obviously, total destruction or replacement of an element has a major impact on that element's historic integrity, and depending on the element's importance, on the historic integrity of the bridge as a whole.

Total replacement of an element is a major compromise, except in the case of in-kind replacement. Elements may be replaced by like-dimensioned elements when original elements have been damaged by accident or material deterioration; the fundamental material must be the same (i.e., timber must be replaced by timber, stone by stone, iron and steel by a ferric material, concrete by concrete), but materials with increased strength and/or reliability may be substituted if safety or availability requirements dictate. Thus, untreated wood may be replaced by treated wood, iron by steel, etc.

The texture and color of such replacements should not be visually intrusive to the structure as a whole. Such in-kind replacements would be considered minor compromise of historic integrity; mass replacement of elements would need to be evaluated for historic integrity loss on a case-by-case basis.

Elements replaced by materials that fall short of in-kind replacement, but are not disruptive to the element's as-built structural and visual impact, should be considered as having suffered a moderate loss of historic integrity. Elements that have been replaced by totally inappropriate elements have suffered a major loss of historic integrity.

Alteration Assessment

Evaluation of the individual National Register eligibility of a bridge assumes a knowledge of all alterations and changes made to the bridge since its construction. Such knowledge may be gained from a thorough investigation of existing official bridge records, plans, and historical sources regarding the bridge. Assessment of the alterations or changes made to a bridge should gauge the impact of the alterations or changes upon the overall significance and historic integrity of the bridge. Certain alterations or changes made within the period of significance may be considered significant alterations or changes which contribute to the overall historical and technological significance of the bridge. That assessment should be made on a case-by-case basis.

The period in which an alteration occurred is relevant to gauging the seriousness of its impact on the structure. A recent alteration is more serious than one which occurred within the structure's period of significance; not only is the degree of alteration likely to be greater, but a modern change most often will reflect technology and engineering solutions that were not available during the

structure's period of significance, thus skewing the overall impact of the structure. An exception to this is in-kind replacement which attempts to mimic the original appearance of the replaced element; an in-kind replacement should be considered neutral with regard to period of alteration. That is, there should be no period penalty for in-kind replacement.

Contributing and Noncontributing Resources

A bridge may also be a contributing resource within a National Register-listed or National Register-eligible historic district. If a bridge retains certain character-defining elements [CDE], it may be listed as a contributing resource to a historic district. For each type and subtype of bridge, the character-defining elements [CDE] have been indicated. All character-defining elements [CDE] for contributing resource evaluation are also primary elements [P] for individual National Register eligibility.

As indicated, serious alterations of a bridge at any time since its construction may reduce the bridge's individual eligibility for the National Register, if the alterations reduce the overall historical and technological significance of the bridge. For contributing resource determinations, however, alterations or changes made to a bridge *during the related historic district's period of significance* may reflect the significant historical and architectural themes and associations that characterize the district. Such alterations or changes do not automatically disqualify a bridge from status as a contributing resource to a National Register-listed or eligible historic district.

If sufficiently serious, alterations and changes made to a bridge may render the bridge a noncontributing resource to a district. Alterations made to a bridge after a related historic district's period of significance may render the bridge a noncontributing resource if such alterations have seriously impacted the bridge's character-defining elements.

I. TIMBER BRIDGES

A. Beam Bridges

N.B., beam bridges may be used as culverts (bridges with spans of less than 20 feet)

1. Superstructure

a. longitudinal beams (stringers) [P] [CDE]

b . floor system [S]

c. deck [T]

d. railing [P] [CDE]

e. applied ornamentation (rare) [T]

f. identifying plaques, plates, or imprints [P]

g. additional functional features* ([T] unless a primary design co-objective, then [P])

h. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. Substructure

a. abutments [P] [CDE] - timber, masonry, or concrete

b. pile bents or piers of masonry or concrete [P] [CDE]

c. applied ornamentation [S]

d. identifying plaques, plates, or imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or

archeological values for which a district is significant)

B. Truss - Uncovered

N.B., uncovered truss bridges may be used as culverts (bridges with spans of less than 20 feet)

1. Superstructure

a. Truss (types = king-post, queen-post, Pratt [timber & iron], Haupt (e.g. 1866 Susquehanna River bridge [w/swing span])

i. endpost [P] [CDE]

ii. bottom chord [P] [CDE]

iii. vertical(s) [P] [CDE]

iv. top chord (not present on king-post) [P] [CDE]

v. floor beams [P]

vi. stringers - [P]

b. deck [S]

c. railing [S]

d. applied ornamentation [T]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural properties, historic associations, or archeological values for which a district is significant)

2. Substructure

a. abutments [P] [CDE]

b. pier(s) - [P] [CDE] when present

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [T]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural properties, historic associations, or archeological values for which a district is significant)

C. Truss - Covered

1. Superstructure - structural

a. Truss (types = king-post, queen-post, Town, Burr, Burr-arch, Long)

i. endpost [P] [CDE]

ii. bottom chord [P] [CDE]

iii. vertical(s) [P] [CDE]

iv. top chord (not present on king-post) [P] [CDE]

v. floor beams [P]

vi. stringers [P]

b. deck [S]

c. railing (n/a)

d. applied ornamentation (probably not an issue)

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. Superstructure - covering

a. Framing [S]

b. Roof [P] [CDE]
roofing material [S]

c. Siding [P] [CDE]

d. Portals [P] [CDE]

e. applied ornamentation [S]

f. identifying plaques, plates, and imprints [P]

g. additional functional features* ([T] unless a primary design co-objective, then [P])

h. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

3. Substructure

a. abutments [P] [CDE]

b. pier(s) [P] - when present [CDE]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

D. Trestle

1. Superstructure - beams [P] [CDE]

2. Substructure

   a. piers [P] [CDE] (or)

   b. bents [P] [CDE]

3. applied ornamentation [T]

4. identifying plaques, plates, and imprints [P]

5. additional functional features* ([T] unless a primary design co-objective, then [P])

6. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

E. Timber-and-concrete Composite

1. Superstructure

   a. composite timber and concrete slab [P] [CDE]

   b. railing of timber or concrete [P] [CDE]

   c. applied ornamentation [T]

   d. identifying plaques, plates, and imprints [P]

   e. additional functional features ([T] unless a primary design co-objective, then [P])

   f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. Substructure

a. timber piers (or) [S] [CDE]

b. timber piles [S] [CDE]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

II. STONE ARCH BRIDGES

N.B., stone arch bridges may be used as culverts (bridges with spans of less than 20 feet)

A. material

1. stone

2. brick (rarely)

B. fabrication: masonry

1. rubble (rough unfinished and untooled stones)

2. squared (stones tooled to rectangular shape and roughly finished)

3. ashlar (squared stones given more refined finish)

C. structure

1. superstructure

a. arch ring [P] [CDE]

b. barrel [P] [CDE]

c. spandrel wall [P] [CDE]

d. parapet [P] [CDE]

e. fill [P] [CDE] - incapable of compromise

f. roadway [T]

g. applied ornamentation [T]

h. identifying plaques, plates, and imprints [P]

i. additional functional features* ([T] unless a primary design co-objective, then [P])

j. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. abutments [P] [CDE]

b. wing walls [P] [CDE]

c. pier(s) [P] [CDE]

d. applied ornamentation [T]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* - ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources

within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

III. METAL TRUSS BRIDGES

N.B., metal truss bridges may infrequently be used as culverts (bridges with spans of less than 20 feet)

A. Superstructure

1. Truss

a. Truss elements (built-up members composed of channels, angles, lacing bars, gussets, and cover plates)

i. endpost [P] [CDE]

ii. bottom chord [P] [CDE]

iii. top chord [P] [CDE]

iv. verticals [P] [CDE]

v. diagonals [P] [CDE]
looped bottom (or)
eye bars

vi. floor beams [P] [CDE]

vii. stringers [S]

viii. bottom lateral bracing [T]

ix. sub-struts [S] [CDE]

x. sub-ties [S] [CDE]

The following additional elements are found in through truss bridges:

xi. portal strut [P] [CDE]

xii. portal bracing [P] [CDE]

xiii. top lateral bracing [S] [CDE]

b. Method of truss connection

i. pinned [S] [CDE]
cotter pins (or)
square nuts (or)
hexagonal nuts (or)

ii. riveted [S] [CDE]

2. deck [T]

3. railing [S]

4. applied ornamentation [T]

5. identifying plaques, plates, and imprints [P]

6. additional functional features* ([T] unless a primary design co-objective, then [P])

7. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Substructure

1. abutments of stone, cement, or timber [P] [CDE]

2. bearing seats [S]

3. piers (when present) of stone or concrete [P] [CDE]

4. applied ornamentation [T]

5. identifying plaques, plates, and imprints [P]

6. additional functional features* ([T] unless a primary design co-objective, then [P])

7. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic

architectural qualities, historic associations, or archeological values for which a district is significant)

IV. MOVABLE BRIDGES

A. Swing Bridges

1. superstructure

a. swing span (beam or truss)

i. pivot girder [P] [CDE]

ii. pivot [P] [CDE]

center-bearing type
discs
balance wheels
circular track
rim-bearing type
load-bearing wheels or bearings
circular track or drum

iii. drive machinery (including motive power, if not hand-operated) ([P], except motive power, which is [S])

iv. wedge end lifts (or equivalent mechanism) [P]

b. approach spans [S]

c. operator's house (optional) - [P or S]

d. applied ornamentation [T]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. swing span related

i. central pier (supports center of swing span) [P] [CDE]
ii. end rest (supports end of swing span) [P] [CDE]

iii. fenders (protects central pier and end rests) [T]

b. approach span related

i. piers [S]

ii. timber piles [S]

iii. abutments [T]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Bascule Bridges (single or multiple leaf)

1. superstructure

a. trunnion (or)

i. single trunnion (simple) or three trunnions (multiple) [P] [CDE]

ii. integral counterweight [P] [CDE]

iii. struts (multiple trunnion) [P] [CDE]

iv. drive machinery, including motive power ([P], except

motive power, which is [S])

b. rolling lift

i. segmental girder [P] [CDE]

ii. track [P] [CDE]

iii. counterweight [P] [CDE]

iv. drive machinery, including motive power ([P], except motive power, which is [S])

c. operator's house (optional) [P or S]

d. applied ornamentation [T]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. bascule span related

i. piers or piles [P] [CDE]

ii. fenders [T]

b. approach span related

i. piers [S]

ii. timber piles [S]

iii. abutments [T]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

C. Vertical Lift Bridges

1. superstructure

a. movable section

i. towers (two) [P] [CDE]

ii. lifting span [P] [CDE] (supported by deck or through truss) - consult relevant span type

iii. overhead truss [P] [CDE] (optional; not needed if towers alone were sufficiently stable)

iv. drive machinery, including motive power if not hand-driven ([P] [CDE], except motive power, which is [S])

v. operator's house [P or S] (optional)

vi. applied ornamentation [T]

vii. identifying plaques, plates, and imprints [P]

viii. additional functional features* ([T] unless a primary design co-objective, then [P])

ix. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

b. approach spans [S]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. movable span related

i. piers or piles [P] [CDE]

ii. fenders [T]

b. approach span related

i. piers [S]

ii. timber piles [S]

iii. abutments [T]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to

the historic architectural qualities, historic associations, or archeological values for which a district is significant)

D. Retractile Bridges

1. superstructure

a. movable span related

i. stationary support span with track (supports movable span when open) [P] [CDE]

ii. movable span (beam or truss) equipped with load-bearing wheels or bearings [P] [CDE]

iii. drive machinery, including motive power if not hand-driven ([P], except motive power, which is [S])

b. approach spans [S]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. movable span related

i. piers or piles [P] [CDE]

ii. fenders [T] -

b. approach span related

i. piers [S]

ii. timber piles [S]

iii. abutments [T, unless immediately adjoining movable span, then S]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

E. Pontoon Bridges

1. superstructure - deck [P] [CDE] -

2. substructure

a. boats (or pontoons) [P] [CDE]

b. abutment, or bank anchor [P] [CDE]

3. applied ornamentation [T]

4. identifying plaques, plates, and imprints [P]

5. additional functional features* ([T] unless a primary design co-objective, then [P])

6. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

V. METAL GIRDER BRIDGES

N.B., metal girder bridges may be used as culverts (bridges with spans of less than 20 feet)

A. Rolled Girder Bridges

1. superstructure

a. rolled longitudinal I-beams or wide flange beams [P] [CDE]

b. floor system [S]

c. deck [S]

d. applied ornamentation [T]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. abutments of stone, cement, or timber [P] [CDE]

b. pier(s) (when present) of stone or concrete [P] [CDE]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Rolled Girder Bridges (Concrete Encased)

1. superstructure

a. rolled longitudinal I-beams or wide flange beams [P] [CDE]; concrete encasement [P] [CDE]

b. floor system [S]

c. deck [T]

d. applied ornamentation [S]

e. identifying plaques, plates, and imprints [T]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. abutments of stone, cement, or timber [P] [CDE]

b. pier(s) (when present) of stone or concrete [P] [CDE]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P] [CDE]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

C. Plate Girder Bridges

1. superstructure

a. plate girders [P] [CDE]

b. floor system [S]

c. deck [T]

d. applied ornamentation [T]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. abutments of stone, cement, or timber [P] [CDE]

b. pier(s) (when present) of stone or concrete [P] [CDE]

c. applied ornamentation [T]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

D. Plate Girder Bridges (Concrete Encased)

1. superstructure

a. plate girders [P] [CDE]

b. concrete encasement [P] [CDE]

c. floor system [S]

d. deck [T]

e. applied ornamentation [S]

f. identifying plaques, plates, and imprints [P]

g. additional functional features* ([T] unless a primary design co-objective, then [P])

h. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. abutments of stone, cement, or timber [P] [CDE]

b. pier(s) (when present) of stone or concrete [P] [CDE]

c. applied ornamentation [S]

d. identifying plaques, plates, and imprints [P]

e. additional functional features* ([T] unless a primary design co-objective, then [P])

f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

VI. METAL SUSPENSION BRIDGES

A. Superstructure

1. tower [P] [CDE]

2. cradles [P] [CDE]

3. cable (or chain) [P] [CDE]

4. suspenders [P] [CDE]

5. stiffening truss [P] [CDE]; if absent [NA]

6. floor system [S]

7. deck [T]

8. applied ornamentation [S]

9. identifying plaques, plates, and imprints [P]

10. additional functional features* ([T] unless a primary design co-objective, then [P])

11. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Substructure

1. anchors (abutments) [P] [CDE]

2. piers [P] [CDE]

3. applied ornamentation [S]

4. identifying plaques, plates, and imprints [P]

5. additional functional features* ([T] unless a primary design co-objective, then [P])

6. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

VII. METAL ARCH BRIDGES

A. Superstructure

1. arch member

a. curved girder [P] [CDE] (or)

b. curved truss [P] [CDE]

i. top chord [P] [CDE]

ii. bottom chord [P] [CDE]

iii. post (truss diagonal) [P] [CDE]

2. suspenders [P] [CDE]

3. ties [P] [CDE]

4. floor system [S]

5. deck [T]

6. applied ornamentation [T]

7. identifying plaques, plates, and imprints [P]

8. additional functional features* ([T] unless a primary design co-objective, then [P])

9. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Substructure

1. buttresses (abutments) [P] [CDE]

2. pier(s) - when present [P] [CDE]

3. applied ornamentation [T]

4. identifying plaques, plates, and imprints [P]

5. additional functional features* ([T] unless a primary design co-objective, then [P])

6. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

VIII. METAL CANTILEVER BRIDGES

A. Superstructure (truss or girder--see type for individual members)

1. anchor arms (2) [P] [CDE]

2. cantilever arms (2) [P] [CDE]

3. central suspended span (carried by anchor arms) [P] [CDE]

4. applied ornamentation [T]

5. identifying plaques, plates, and imprints [P]

6. additional functional features* ([T] unless a primary design co-objective, then [P])

7. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Substructure

1. piers supporting anchor arms [P] [CDE]
2. anchor piers supporting cantilever arms [P] [CDE]

3. abutments [S]

4. applied ornamentation [T]

5. identifying plaques, plates, and imprints [P]

6. additional functional features* ([T] unless a primary design co-objective, then [P])

7. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

IX. CONCRETE BRIDGES

A. Concrete Arch Bridges

N.B., concrete arch bridges may be used as culverts (bridges with spans of less than 20 feet)

1. filled spandrel bridges

a. superstructure

i. arch ring [P] [CDE]

ii. barrel [P] [CDE]

iii. spandrel wall [P] [CDE]

iv. fill [NA]

v. railing or parapet [P] [CDE]

vi. applied ornamentation [S]

vii. identifying plaques, plates, and imprints [P]

viii. additional functional features* ([T] unless a primary design co-objective, then [P])

ix. additional functional features* for contributing

resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

b. substructure

i. abutments [P] [CDE]

ii. wing walls [P] [CDE]

iii. pier(s) - when present [P] [CDE]

iv. applied ornamentation [S]

v. identifying plaques, plates, and imprints [P]

vi. additional functional features* ([T] unless a primary design co-objective, then [P])

vii. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. closed spandrel bridges

a. superstructure

i. arch ribs [P] [CDE]

ii. spandrel wall [P] [CDE]

iii. railing or parapet [P] [CDE]

iv. applied ornamentation [S]

v. identifying plaques, plates, and imprints [P]

vi. additional functional features* ([T] unless a primary design co-objective, then [P])

vii. additional functional features* for contributing resources within historic districts ([CDE] if the feature

contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

b. substructure

i. abutments [P] [CDE]

ii. wing walls [P] [CDE]

iii. pier(s) - when present [P] [CDE]

iv. applied ornamentation [S]

v. identifying plaques, plates, and imprints [P]

vi. additional functional features* ([T] unless a primary design co-objective, then [P])

vii. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

3. open spandrel bridges

a. superstructure

i. arch ribs [P] [CDE]

ii. spandrel [P] [CDE]
spandrel column [P] [CDE]

spandrel arch [P] [CDE]

iii. arch ribs [P] [CDE]

iv. railing or parapet [P] [CDE]

v. applied ornamentation [S]

vi. identifying plaques, plates, and imprints [P]

vii. additional functional features* ([T] unless a primary

design co-objective, then [P])

viii. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

b. substructure

i. abutments [P] [CDE]

ii. wing walls [P] [CDE]

iii. pier(s) - when present [P] [CDE]

iv. applied ornamentation [S]

v. identifying plaques, plates, and imprints [P]

vi. additional functional features* ([T] unless a primary design co-objective, then [P])

vii. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

4. through (or rainbow) arch bridges

a. superstructure

i. arch ribs [P] [CDE]

ii. ties [S] [CDE]

iii. lower chord [P] [CDE]

iv. suspenders [P] [CDE]

iv. floor beams [P] [CDE]

v. deck [S]

vi. railing [T]

vii. applied ornamentation [S]

viii. identifying plaques, plates, and imprints [P]

ix. additional functional features* ([T] unless a primary design co-objective, then [P])

x. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

b. substructure

i. abutments [P] [CDE]

ii. wing walls [P] [CDE]

iii. pier(s) - when present [P] [CDE]

iv. applied ornamentation [S]

v. identifying plaques, plates, and imprints [P]

vi. additional functional features* ([T] unless a primary design co-objective, then [P])

vii. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

B. Concrete Slab Bridges

N.B., concrete arch bridges may be used as culverts (bridges with spans of less than 20 feet)

1. superstructure

    a. slab [P] [CDE]

    b. parapet or railing [P] [CDE]

    c. roadway [T]

    d. applied ornamentation [S]

    e. identifying plaques, plates, and imprints [P]

    f. additional functional features* ([T] unless a primary design co-objective, then [P])

    g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

    a. abutments [P] [CDE]

    b. wing walls [P] [CDE]

    c. pier(s) - when present [P] [CDE]

    d. applied ornamentation [S]

    e. identifying plaques, plates, and imprints [P]

    f. additional functional features* ([T] unless a primary design co-objective, then [P])

    g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

C. Concrete Beam Bridges

1. superstructure

a. slab [P] [CDE]

b. longitudinal beams (on T-beam bridges, slab and longitudinal beams are integrated) [P] [CDE]

c. parapet or railing, when integral [P] [CDE]

d. roadway [T]

e. applied ornamentation [S]

f. identifying plaques, plates, and imprints [P]

g. additional functional features* ([T] unless a primary design co-objective, then [P])

h. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

a. abutments [P] [CDE]

b. wing walls [P] [CDE]

c. pier(s) - when present [P] [CDE]

d. applied ornamentation [S]

e. identifying plaques, plates, and imprints [P]

f. additional functional features* ([T] unless a primary design co-objective, then [P])

g. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

D. Rigid Frame Bridges

N.B., Rigid frame bridges are designed as monolithic structures, in which the superstructure and the substructure are of one continuous fabric; possibly used for culverts (bridges with span length under 20 feet)

1. superstructure

    a. deck [P] [CDE]

    b. parapet or railing [P] [CDE]

    c. applied ornamentation [S]

    d. identifying plaques, plates, and imprints [P]

    e. additional functional features* ([T] unless a primary design co-objective, then [P])

    f. additional functional features* for contributing resources within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

2. substructure

    a. abutments [P] [CDE]

    b. wing walls [P] [CDE]

    c. piers (when present) [P] [CDE]; large multi-span rigid frame bridges feature:

        stiff towers

        slender expansion piers

    d. applied ornamentation [S]

    e. identifying plaques, plates, and imprints [P]

    f. additional functional features* ([T] unless a primary design co-objective, then [P])

    g. additional functional features* for contributing resources

within historic districts ([CDE] if the feature contributes to the historic architectural qualities, historic associations, or archeological values for which a district is significant)

* additional functional features could include:

1. lamp posts - if designed for bridge and integrated into design, their loss or disharmonious replacement becomes more serious; importance declines with technological interest of bridge type

2. streetcar tracks - if provision for streetcars was a primary design co-objective, tracks increase in importance

3. streetcar catenary supports and lines - if provision for streetcars was a primary design co-objective, catenary supports and lines increase in importance

4. toll houses - if designed as an important architectural element of the bridge, toll houses increase in importance

5. signage and traffic control devices - gates for movable bridges are more important than signage on other types of bridges

6. manhole covers - if designed specially for bridge, manhole covers increase in element importance, but never to exceed secondary importance.

7. utility pipes and conduits - if integrated into design as visually or structurally important element, their loss is important; otherwise, they are of negligible importance, unless the retrofitting of them has seriously compromised design

8. water flow control devices - if bridge was designed with the control of water flow as a primary co-objective, the device should be accorded a primary element status; retrofitted devices should be accorded secondary status if fitted within the structure's period of significance; otherwise they are tertiary.

SECTION D. BRIDGES AS CONTRIBUTING RESOURCES WITHIN HISTORIC DISTRICTS

1. Introduction

Although sometimes neglected as possible contributing resources in National Register historic districts, bridges were often important elements in the formation and development of both large and small communities and industrial areas in the state. For a variety of reasons, communities and industries frequently took root and flourished in close proximity to rivers, creeks, and inlets; bridges served as essential links in the transportation system that connected developing areas with one another. The rapidity with which damaged or destroyed bridges were repaired or replaced by public or private means underscores the importance of bridges to the areas they served. Historically, Maryland's road network has depended upon bridges, as have canals and railroads as well.

Bridges are conceived, built, and used as functional structures, but they have also served, by design or accident, objectives and purposes beyond transportation. Bridges connect, but they can also act as a demarcation; a bridge often serves as a portal to a community. When located within a community, the bridge may reflect the architectural values displayed by the area's buildings. Regardless of the builder's intent, the bridge also frequently serves a community as a place where locals can fish, swim, meet, or even dance. As with any building, a bridge can be a place where local residents interact with each other; a bridge can serve a community in numerous and diverse ways.

Bridges of all types may thus be possible contributing resources in Maryland's National Register-listed or eligible historic districts. In order to determine the ways in which bridges might be included as contributing resources in National Register historic districts, an examination was made of 161 historic districts in the state of Maryland. Maryland's historic districts show great diversity in size, character, period of significance, and the architectural character of contributing buildings and structures. The size of Maryland's historic districts ranges from a handful of resources to areas containing thousands of buildings or acres. Urban, rural, residential, and industrial themes are all found.

The history of Maryland is well illustrated by its existing historic districts, which encompass a broad chronological range from the seventeenth through the twentieth centuries. The following table indicates the breadth of historical time represented in the periods of significance associated with existing Maryland historical districts:

Centuries Represented by Historic Districts

Century	Number of Districts
17th	9
18th	64
19th	142
20th	142

As indicated, the nineteenth and twentieth centuries are represented most heavily; the eighteenth century's representation is less than half of either of the succeeding centuries, and the seventeenth century is only rarely included in a period of significance.

Aside from a few districts with periods of significance of five years or less, the periods of significance of most districts encompass the founding, maturation, and transformation of communities over a span of at least several generations. Very frequently both the nineteenth and twentieth centuries are included in a district's period of significance, and a sizable number of Maryland historic districts span the eighteenth through the twentieth centuries. The average span for all Maryland historic districts is over 100 years; more than a quarter of the districts feature a period of significance exceeding 150 years.

Districts with long periods of significance (over 100 years) are not restricted to any particular type; they are found in cities or towns (37 districts); rural, agricultural areas (16 districts); rural industry/industry-centered areas (10 districts); and civic or educational areas (8 districts).

The architectural styles of buildings within these chronologically broad-based districts reflect the changing aesthetic conventions of the communities. The full gamut of eastern U.S. residential architectural styles is encountered, sometimes in homogeneous groupings, sometimes in groupings where an early Federal-style house is near a twentieth-century bungalow. Commercial and industrial architecture is also varied, and the state historic districts include a range of civic buildings, farmsteads, institutional complexes, and waterfronts.

Reflecting the changing technologies used to span rivers and roads, Maryland's bridges reveal diversity in bridge building technology. Virtually every type of bridge has been built within the state at one time or another, and extant examples can still be found of many of these types. In addition to illustrating technology, bridges also reflect the aesthetic conventions of the period when they were built. As with buildings, bridges may reflect high-style design or vernacular trends, and the aesthetic decisions made in designing a bridge may add to the historical and architectural significance of a district.

Along with buildings, bridges may make a significant contribution to defining the character of Maryland's historic districts.

2. Guidelines for Contributing Resource Determination

Specific guidelines may aid in the evaluation of bridges as possible contributing resources to National Register-listed or National Register-eligible historic districts in Maryland. National Register Bulletin 14, *Guidelines for Contributing and Noncontributing Resources for National Register Documentation* (5/85, revised 11/86) defines contributing and noncontributing resources as follows:

> "A contributing building, site, structure, or object adds to the historic architectural qualities, historic associations, or archeological values for which a property is significant because a) it was present during the period of significance, and possesses historic integrity reflecting its character at that time or is capable of yielding important information about the period, or b) it independently meets the National Register criteria."
>
> "A noncontributing building, site, structure, or object does not add to the historic architectural qualities, historic associations or archeological values for which a property is significant because a) it was not present during the period of significance, b) due to alterations, disturbances, additions, or other changes, it no longer possesses historic integrity reflecting its character at that time or is incapable of yielding information about the period, or c) it does not independently meet the National Register criteria."

Bulletin 14 requires that all contributing and noncontributing resources within a National Register-eligible historic district be counted. The following expanded criteria are recommended for evaluating bridges for their potential status as contributing or noncontributing resources to historic districts:

> A bridge may be a contributing resource to a National Register-listed or National Register-eligible historic district for any of the following reasons:
>
> a) It was present or originally built during the district's period of significance, and possesses historic integrity reflecting its character during the district's period of significance, or is capable of yielding important information about the period. All extant bridges built during the district's period of significance and possessing sufficient historic integrity may be listed as contributing resources. It should be noted that certain alterations and changes to a bridge made during the district's period of significance may themselves be significant. Assessment of the significance of alterations should be made on a case-by-case basis. Alterations and changes may also occur to a bridge after a district's defined period of significance. In

order to document alterations and changes, a thorough effort must be made to determine the construction and maintenance history of each bridge, through consultation of all available official records and plans. If a bridge built within ten years of the close of a district's period of significance complements the historical and architectural character of the district in style, scale, and materials, the bridge may be a contributing resource and the district's period of significance may be extended to include the bridge's date of construction.

b) It independently meets the National Register criteria. All bridges meeting the National Register criteria for individual eligibility and originally built during the district's period of significance may be listed as contributing resources. This may include National Register-listed or eligible bridges built elsewhere, moved to their current location at any time, and reerected there at any time *without loss of individual National Register-eligibility* (such as a National Register-eligible metal truss bridge moved to a new location). A bridge may contribute to a district on the basis of significance unrelated to that of the district, provided the bridge independently meets the National Register criteria for individual eligibility.

A bridge may be a noncontributing resource for the following reasons:

a) It was not present or not originally built during the district's period of significance.

b) Due to alterations, disturbances, additions, or other changes, it no longer possesses historic integrity reflecting its character during the district's period of significance, or is incapable of yielding information about the period.

c) It does not independently meet the National Register criteria.

Section C, "Physical and Associative Characteristics and Historic Integrity Consideration," above, presents an additional guide to assessing character-defining elements [CDE] of bridges being evaluated as possible contributing resources in National Register-listed or eligible historic districts.